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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/272,524	10/13/2011	Robert M. Wepfer	NSD2011-002	1051

26353 7590 04/24/2017
WESTINGHOUSE ELECTRIC COMPANY, LLC
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EXAMINER

LIN, KO-WEI

ART UNIT	PAPER NUMBER
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3749

NOTIFICATION DATE	DELIVERY MODE
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04/24/2017

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ROBERT M. WEPFER, JAMES R. SCHWALL,
CHRISTOPHER A. WEINDORF, and JOHN R. BALAVAGE

Appeal 2015-008225¹
Application 13/272,524²
Technology Center 3700

Before MURRIEL E. CRAWFORD, KENNETH G. SCHOPFER, and
BRADLEY B. BAYAT, *Administrative Patent Judges*.

SCHOPFER, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) from the rejection of
claims 1–14. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ Our Decision references the Appeal Brief (“Appeal Br.,” filed Apr. 1, 2015) and Reply Brief (“Reply Br.,” filed Sept. 10, 2015), and the Examiner’s Answer (“Ans.,” mailed July 30, 2015) and Final Office Action (“Final Act.,” mailed Dec. 18, 2014).

² According to Appellants, the real party in interest is Westinghouse Electric Company LLC. Appeal Br. 2.

BACKGROUND

According to Appellants, “[the] invention relates generally to tube support arrangements for steam generators and more particularly to a tube support arrangement for a tube and shell steam generator that minimizes clogging of the recirculation flow holes in the tube support plates among the outside of the heat exchanger tubes.” Spec. ¶ 1.

CLAIMS

Claims 1–14 are on appeal. Claim 1 is the only independent claim on appeal and recites:

1. A tube and shell steam generator comprising:
 - an elongated shell having an axis extending along the elongated dimension;
 - a tube sheet within the shell supported substantially transverse to the axis;
 - a plurality of heat exchange tubes extending axially from the tube sheet within the shell, with the plurality of heat exchange tubes forming a tube bundle in which a primary fluid passes within the heat exchange tubes and a secondary fluid passes around the outside of the heat exchange tubes; and
 - a plurality of tandemly spaced tube support plates respectively positioned substantially transverse to the axis and extending substantially over a width of the tube bundle, with substantially each of the plurality of heat exchange tubes passing through a separate, corresponding tube support hole axially extending through at least some of the tube support plates, wherein the tube support plates are designed to pass the secondary fluid through the tube support holes in the tube support plates with a flow of the fluid regulated so the flow is larger through some of the tube support holes of the tube support plates than other of the tube support holes of the tube support plates.

Appeal Br. 10.

REJECTIONS³

1. The Examiner rejects claims 1–13 under 35 U.S.C. § 103(a) as unpatentable over Wilson⁴ in view of Gilbreath.⁵
2. The Examiner rejects claim 14 under 35 U.S.C. § 103(a) as unpatentable over Wilson in view of Gilbreath and Hawkins.⁶

DISCUSSION

With respect to independent claim 1, the Examiner finds that Wilson discloses a device including an elongated shell, a tube sheet, a plurality of heat exchange tubes, and a plurality of tandemly spaced tube support plates. Final Act. 3. The Examiner acknowledges that “Wilson fails to teach substantially each of plurality of tubes comprising each of said plurality of heat exchange tubes passing through a separate corresponding tube support hole so the flow is larger through some of the tube support holes than other of the tube support holes.” *Id.* The Examiner finds that Gilbreath teaches a plurality of tubes each passing through a separate support hole “so the flow is larger through some of the tube support holes than other of the tube support holes.” *Id.* at 4 (citing Gilbreath Fig. 1). The Examiner concludes that “[i]t would have been obvious to one of ordinary skill in the art at the time of invention to modify Wilson by replacing the tube support plates with the tube support device as taught by Gilbreath in order to provide a more secured and stronger support for tubes.” Final Act. 4.

³ The Examiner has withdrawn the rejection of claims 1–14 under 35 U.S.C. § 112, second paragraph. *See* Ans. 8.

⁴ Wilson, US 6,059,022, iss. May 9, 2000.

⁵ Gilbreath, US 8,342,474 B2, iss. Jan. 1, 2013.

⁶ Hawkins et al., US 6,189,212 B1, iss. Feb. 20, 2001.

We are persuaded by Appellants' argument that the proposed combination of art would not result in a device as claimed. In particular, the claim requires a plurality of tandemly spaced tube support plates such that substantially each of the heat exchange tubes pass through a separate support hole and including a design that allows for the flow of secondary fluid around the tubes and through the support holes at different flow rates. We find that the Examiner has not shown how or why one of ordinary skill in the art would have combined the references to include the design claimed, including the use of support holes that regulate the flow of secondary fluid as claimed. In particular, we agree with Appellants that Wilson discloses support plates with support holes of substantially the same size in which bundles of four tubes pass through each support hole and that

[w]hile *Gilbreath* teaches a support block having different size holes, each hole is sized to mate with the outside diameter of the tubular member it is intended to support and there is no teaching of providing a space on the outside of the tubular member for the passage of a fluid over and around the outside of the tubular member through the support block.

Appeal Br. 6. Thus, we find that *Gilbreath*, at best, would have led one of ordinary skill in the art to incorporate into Wilson's device a support plate with individual holes for the tubes, wherein each hole is sized to mate with the outside diameter of the tube. This finding appears to be supported by the Examiner's conclusion that one of ordinary skill in the art would have relied on *Gilbreath*'s individual tube supports "to provide a more secured and stronger support for tubes." Final Act. 4. However, we do not see any indication in the cited portions of Wilson or *Gilbreath* that the combination would have led to the design as claimed, including varying the size of the support holes to regulate *secondary* fluid flow, and, therefore, we are not

persuaded that the Examiner's proposed combination would have led one of ordinary skill in the art to produce a device as claimed. We note that the Examiner finds that the different sized tubes in Gilbreath would necessarily allow for larger flow through some of the tubes and support holes, but there is inadequate support that this would have led to the design claimed in which the support holes vary in size such that secondary fluid flow rate varies, i.e. varying the flow rate of fluid surrounding the tubes and not the fluid within the tubes.

Accordingly, we are persuaded of reversible error with respect to the rejection of claim 1, and, thus, we do not sustain the rejection of claim 1. For the same reasons, we do not sustain the rejections of the dependent claims 2–14, the rejections of which rely on the same error discussed with respect to the rejection of independent claim 1.

CONCLUSION

We reverse the rejections of claims 1–14 for the reasons set forth above.

REVERSED